Chair Rise Kinetics and Correlates of Performance in Young and Older Males

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Purpose: To compare chair rise kinetics in young (YM) and older (OM) males, and determine correlates of chair rise performance. **METHODS:** YM (n=15, age =20.7±2.2 yrs) and OM (n=15, age=71.6±3.9yrs) performed three trials of a single chair rise as quickly as possible on a force plate and the vertical ground reaction force (VGRF) signal was analyzed. Peak VGRF (PF), as well as peak (100 ms rolling average), early (minimum VGRF to 50% PF), late (50% PF to PF), and overall (minimum VGRF to PF) rate of force development (RFD; Δforce/Δtime) were calculated based on phases of the task. Power and velocity parameters as well as quadriceps rate of electromyography rise (RER) were also obtained. Independent samples t-tests were used for age comparisons, and Pearson correlation coefficients were calculated for each group to examine select relationships. **RESULTS:** Chair rise time, average power, early RFD, and leg lean mass were similar between groups ($p>0.05$). All other power, velocity, RFD, and RER measures were lower in OM ($p<0.05$). PF and all RFD measures, except late RFD, were strongly correlated with chair rise performance in OM, while PF and peak RFD were only moderately correlated with performance in YM. **CONCLUSIONS:** As expected, most kinetic variables were diminished in OM, but our data indicate that average power and early RFD are not sensitive to age. Further, PF and RFD are more associated with chair rise time and power in OM compared to YM, yet neither lower-body lean mass nor rapid muscle activation are influential.

Keywords:

Aging, Rate of force development, Physical function, Electromyography